

## GMOs AROUND THE WORLD

## HELPING FARMERS HELP THEMSELVES

What if there was a way to help farmers grow crops that could protect themselves from pests while producing essential vitamins and minerals to fight malnutrition in children? That way is **genetic engineering**.

Genetic engineering allows researchers to alter the plant's own DNA (**cisgenic**) or move genes between organisms (**transgenic**). Modifying the DNA of crop plants can allow them to resist devastating diseases, repel insect pests and ease weed management, all while delivering better nutrition to those who need it most.

Bill Gates and Dr. Joseph Ndonguru at Mikochei Agricultural Research Institute in Mozambique

## BETTER BRINJAL

Eggplant, or brinjal, is a staple food in Bangladesh and other southeast Asian countries. Unfortunately, a pest called a fruit and shoot borer regularly infests the crop, forcing farmers to spray insecticides numerous times to control the pests. Farmers and farm workers often apply these products with backpack sprayers with no special precautions – often in bare feet. It's unhealthy for farmers and for the environment as well as consumers since the multiple pesticide applications can leave residues on the eggplant when it gets to market.

Genetically engineered crops designed to resist pests greatly reduces the need to spray insecticides. Provided free to farmers by governments and international agencies, these crops help them produce food more safely and more easily make a living for themselves and their families.

## Power to the people

Farmers have a lot of decisions to make, including what products to buy to protect the crop from pests and what crops will best help them grown nutritious food for their families and for market. Government agencies and international development organizations are developing genetically engineered crops such as rice, bananas and eggplant that can deliver these benefits in seeds and cuttings. These agencies provide these crops for free so they can be saved and used every year, putting the power in farmers' hands.



Other crops are aimed at improving nutrition. Crops such as Golden rice and bananas, iron- and zinc-fortified rice and various disease- and pest- resistant varieties are projects developed in partnership among government, university and companies. These products are also provided to farmers for free.





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## WHERE BANANAS ARE THE STAFF OF LIFE

Left unchecked, Xanthomonas wilt is 100 per cent lethal to bananas, wiping out farmers' food security along with their livelihood. It's a critical problem in Uganda, where people eat about three quarters of a kilogram every day of bananas and plantains (a less sweet, more-starchy version) – the highest consumption on earth.

Using genetic engineering, Ugandan researchers moved genes from a pepper to bananas to make them resistant to Xanthomonas.

As the second largest banana producer in the world, the east African country gives bananas high priority. Their researchers have also developed banana varieties resistant to nematode (worm) pests and are looking at solutions for other banana diseases.



Banana Plantation



Banana Wilt

## Local research, local priorities

People in different countries eat different foods. About 90 per cent of the world's rice is eaten in Asia. East Africans get a lot of their calories from different varieties of banana. Even crops like corn and rice, which are grown around the world, must be adapted for local weather, soils and pests.

Researchers are guided by local priorities, that is, what those countries' farmers and consumers want to see in their fields and on their dinner tables.

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**I'LL HAVE THE EGGPLANT.  
HOLD THE GRUBS,  
PLEASE.**

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Eggplant Field

